

REPORT



10 Stukeley Street, London

Noise Impact Assessment

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1.0 Introduction

Clear Acoustic Design has been appointed to carry out a noise impact assessment in relation to the proposed mechanical plant installation at 10 Stukeley Street, London, WC2B 5LQ. Proposals are for the installation of 2 external AC condenser units.

The local planning authority has requested a noise impact assessment in order to safeguard the amenity of the surrounding receptors. The noise impact assessment is in line with BS 4142: 2014+ A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. These criteria are seen to be appropriate in assessing and mitigating noise impact from this source.

2.0 Performance Standards

2.1 Local Authority Requirements

The local planning authority has set the following planning conditions in relation to the proposed mechanical plant installation.

- 7 *Prior to the occupation of the offices hereby approved, details of any new air conditioning equipment, including any necessary acoustic enclosures, and a full noise impact assessment, including details of any necessary sound attenuation for the plant, shall be submitted to and approved in writing by the local planning authority. The relevant part of the works shall be carried out in accordance with the details thus approved and shall thereafter be maintained in effective order to the reasonable satisfaction of the Council.*
- 8 *Noise levels at a point 1 metre external to sensitive facades shall be at least 5 dBA less than the existing background measurement (LA90), expressed in dBA when all new plant / equipment (or any part of it) is in operation unless the plant / equipment will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and / or if there are distinct impulses (bangs, clicks, clatters, thumps), then the noise levels from that piece of plant / equipment at any sensitive façade shall be at least 10 dBA below the LA90, expressed in dBA.*

2.2 BS 4142: 2014 + A1: 2019

BS 4142: 2014 + A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound* has formed the basis of the assessment in this report. In this case, the rating level requirement for the proposed plant is 5 dB below the existing background noise level, as required by Planning Condition 8.

3.0 Environmental Noise Survey

In order to assess the noise impact of the proposed mechanical plant installation, an environmental noise survey has been undertaken by Clear Acoustic Design at a location representative of the nearest noise sensitive receptor(s).

The receptor locations are taken to be the facades surrounding the proposed plant location, which contain some residential windows. The microphone was located on the flat roof directly adjacent to these windows (approximately 2 metres). This is therefore seen to be a representative location.

The environmental noise survey has provided background noise levels, which will form the basis of the assessment in line with BS 4142: 2014. Background noise levels were measured between 22/09/22 and 23/09/22 using a single fixed noise monitor (referred to as F1).

3.1 Measurement Equipment and Environmental Conditions

The weather was witnessed to be overcast and dry for the duration of the survey with light wind speeds. The following measurement equipment was used for the survey.

Equipment	Serial Number	Calibration Date
Casella CEL-633C Type 1 Sound Level Meter	2145374	18/02/22
Casella CEL-495 Preamplifier	002436	18/02/22
B&K 4189 Microphone	2529821	18/02/22
Casella CEL-120-1 Calibrator	113251	18/02/22

Table 3.1 Measuring Equipment used for Survey

3.2 Fixed Noise Monitoring Graph – F1

Figure 3.1 below provides a graph of the measured noise levels at Location F1. The ambient (L_{Aeq}) and background (L_{A90}) noise levels are shown.

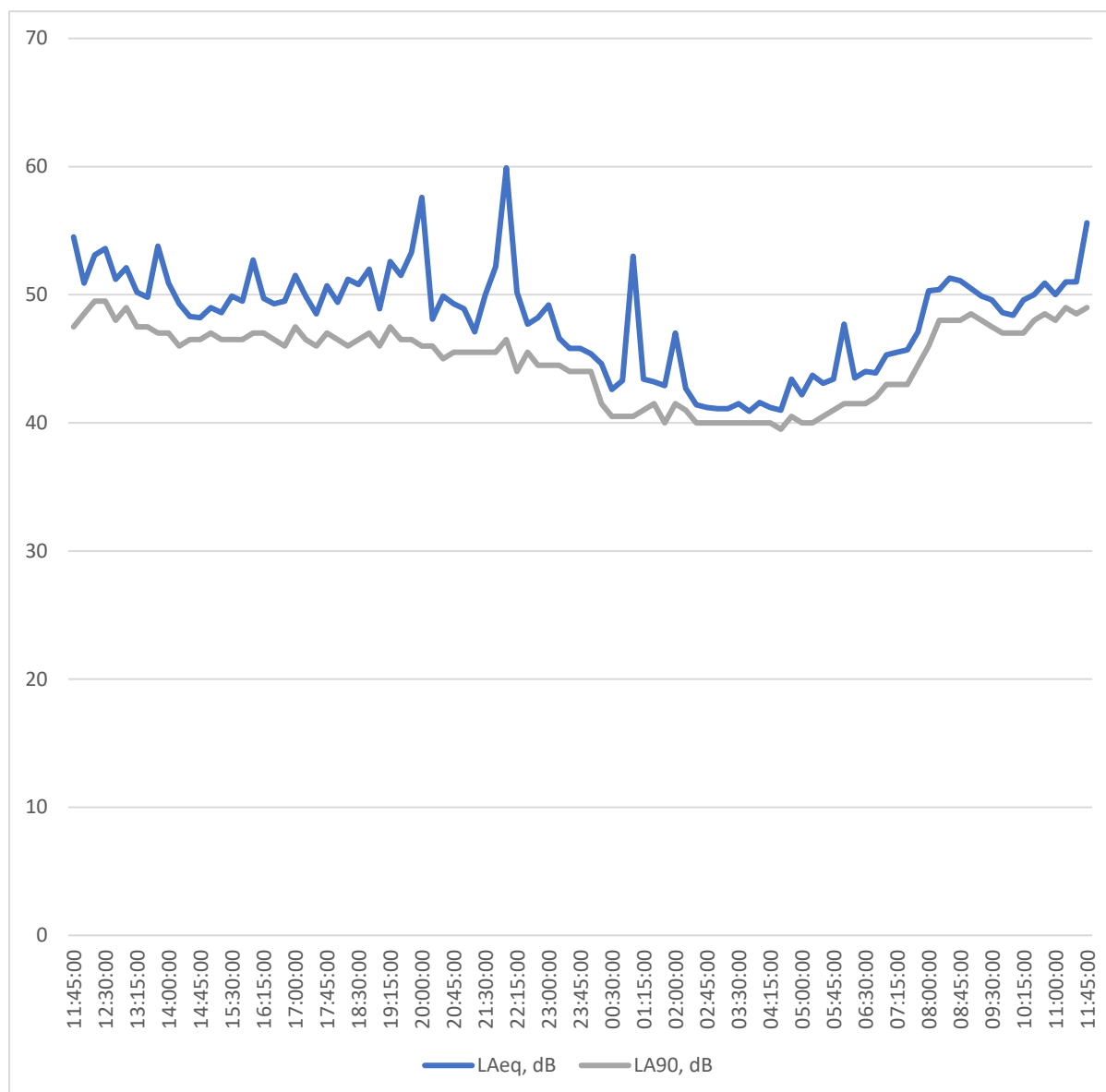


Figure 3.1 Long Term Measurement Graph – F1

3.2.1 Assessment Background Noise Level

In order to conduct an assessment in line with BS 4142: 2014, it is necessary to extrapolate representative background noise levels from the long term survey data. The proposed mechanical plant will operate during day time hours and therefore the background noise levels during this time will be applicable. The background noise level which will form the basis of the assessment is presented in Table 3.1 below.

Assessment Background Noise Level, L_{A90} dB
46

Table 3.1: Assessment Background Noise Level

4.0 Noise Impact Assessment

4.1 Noise Sources

The proposed external installation will be comprised of 2 AC condenser units. The proposed units are from Daikin. In order to meet the rating level limits, the units are to be housed within acoustic enclosures from *Environ*.

The noise emission levels which have formed the basis of the assessment are presented in Table 4.1 below and are based on the manufacturer datasheets. These are inclusive of the proposed enclosures. Full details are provided in Appendix B.

The external units are to be located on the flat roof at a distance of approximately 3.8 metres from the nearest noise sensitive façade. The use within this façade is understood to be residential.

The proposed units are not seen to be tonal nor impulsive in nature. Given the low sound pressure levels from the proposed enclosed units, it is seen that the specific noise level will not be readily distinctive against the residual acoustic environment. Background noise levels are fairly high in this location, which provides significant masking sound.

Type	No of Units	SPL at 1m, dBA
RZAG-100-NV1, Environ Enclosure	1	24
RZAG-125-NV1, Environ Enclosure	1	26

Table 4.1: Enclosed Noise Sources, Sound Pressure Levels, dBA

4.2 Assessment Outcome

In order to demonstrate compliance with local authority rating level requirements, Table 4.3 below provides an assessment in line with BS 4142: 2014 + A1: 2019, based on the proposed enclosed units.

As can be seen, the cumulative rating level for both units is 23 dB below the background noise level. This is seen to be in full accordance with local authority requirements. Supporting calculations are provided in Appendix A, Figure A.1.

Time Period	Specific Noise Level, $L_{A_{s,T}}$ dB	Acoustic Feature Correction	Rating Noise Level, $L_{A_{r,T}}$ dB	Background Noise Level, L_{A90} dB	Assessment Outcome
DAY	23	-	23	46	- 23 dB

Table 4.3: BS 4142 Assessment – Outcome, Mitigated

5.0 Conclusion

Clear Acoustic Design has been appointed to carry out a noise impact assessment in relation to the proposed mechanical plant installation at 10 Stukeley Street, London, WC2B 5LQ.

Proposals are for the installation of 2 external AC condenser units. The units are to be housed within acoustic enclosures from *Environ*.

The noise impact assessment is in line with BS 4142: 2014 + A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. These criteria are seen to be appropriate in assessing and mitigating noise impact from this source. The requirements of the local planning authority have been taken in to account with regards to rating level limits.

As can be seen in Table 4.3 above - The rating level of the mechanical plant installation will be in line with the requirements of the local planning authority. The proposed installation is in fact compliant by a large margin. This is seen to relate to the *No Observed Effect Level* (NOEL), under national planning guidelines.

Appendix A – Specific Noise Level Calculation

Noise Emission Calculation		dB(A)
SWL Radiating from	RZAG-100-NV1 (Enclosed)	35
Attenuation		
Louvre Losses		
Radiation Directivity	4	
@ Distance (m)	3.8	
SPL @ Residence		18
SWL Radiating from	RZAG-125-NV1 (Enclosed)	37
Attenuation		
Louvre Losses		
Radiation Directivity	4	
@ Distance (m)	3.8	
SPL @ Residence		20
Combined Specific Noise Level		23

Figure A.1: Specific Noise Level Calculation

Appendix B – Noise Sources, Data Sheets

DATA SHEET

www.environgroup.uk

EG-U84-DK30

Acoustic enclosure for AC Split Systems

21 October 2022

CUSTOMER:			SITE / LOCATION / REFERENCE		
Allstar Air Con			10 Stukeley Rd		
ORIGINAL EQUIPMENT MANUFACTURERS PUBLISHED DATA					
MAKE, MODEL, DIMENSIONS, AIR FLOW & SOUND PRESSURE LEVEL @1.0M FREE FIELD					
MAKE		MODEL		AIR IN	AIR OUT
Daikin		RZAG100NV1		H - 2 Side	H - Front
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)	AIRFLOW (M³s⁻¹)	DISTANCE (M)	SPW dB(A)
1100	460	870	1.36	1	50
INNER CUBE DIMENSION			ENCLOSURE DETAIL		
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)	WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
1200	550	1300	1900	1150	1365
AIRFLOW (M³s⁻¹)	DISTANCE (M)	SPL dB(A)	AIRFLOW (M³s⁻¹)	DISTANCE (M)	SPL dB(A)
1.36	1.0	50	1.36	1.0	24
INLET AIRWAYS			DESIGN CRITERIA		
WIDTH (MM)	HEIGHT (MM)	NO.	UNIT SIZE	INTLET	OUTLET
275	1300	1	OK	OK	OK
OUTLET AIRWAYS			AIRFLOW INFORMATION		
WIDTH (MM)	HEIGHT (MM)	NO.	PD (NM⁻²)	INLET (MS⁻¹)	OUTLET (MS⁻¹)
275	1300	1	17	3.8	3.8
ENCLOSURE INFORMATION					
INLET AIRWAY			WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
OUTLET AIRWAY			275		1300
EXTERNAL SIZE			275		1300
INDICATIVE NOISE LEVEL			1900	1150	1365
			24	**SPW dB(A) SOUND PRESSURE	

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Allstar Air con			10 Stukeley Rd		
ORIGINAL EQUIPMENT MANUFACTURERS PUBLISHED DATA					
MAKE, MODEL, DIMENSIONS, AIR FLOW & SOUND PRESSURE LEVEL @1.0M FREE FIELD					
MAKE		MODEL		AIR IN	AIR OUT
Daikin		RZAG125NV1		H - 2 Side	H - Front
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)	AIRFLOW (M³s⁻¹)	DISTANCE (M)	SPW dB(A)
1100	460	870	1.33	1	52
INNER CUBE DIMENSION			ENCLOSURE DETAIL		
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)	WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
1200	550	1300	1900	1150	1365
AIRFLOW (M³s⁻¹)	DISTANCE (M)	SPL dB(A)	AIRFLOW (M³s⁻¹)	DISTANCE (M)	SPL dB(A)
1.33	1.0	52	1.33	1.0	26
INLET AIRWAYS			DESIGN CRITERIA		
WIDTH (MM)	HEIGHT (MM)	NO.	UNIT SIZE	INTLET	OUTLET
275	1300	1	OK	OK	OK
OUTLET AIRWAYS			AIRFLOW INFORMATION		
WIDTH (MM)	HEIGHT (MM)	NO.	PD (NM²)	INLET (MS⁻¹)	OUTLET (MS⁻¹)
275	1300	1	16	3.7	3.7
ENCLOSURE INFORMATION					
INLET AIRWAY			WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
OUTLET AIRWAY			275		1300
EXTERNAL SIZE			275		1300
INDICATIVE NOISE LEVEL			1900	1150	1365
			26	**SPW dB(A) SOUND PRESSURE	